The Recent Severe Weather

GRANTING (1) that solar periodicity produces a corresponding periodicity in any of the elements which make the climate of the earth as a whole what it is, and (2) that the expression for that periodical change contains only the two first terms of the general expression, *i.e.* that there are no secondary . . . periods, both large admissions in the present state of our knowledge, it does not appear how a simple fluctuation of solar temperature, recurring, we will say, every eleven years, could produce several periodic fluctuations of terrestrial temperature, identical in duration but not simultaneous, some one or more being therefore partially or completely opposed in phase to some one or more of the remainder, and to the causal fluctuation.

Further, we know that solar conditions are not as simple as those above assumed, and that the sun-spot period is subject to large and seemingly capricious variation amounting to something like ± 3 years at least. If then, as some able physicists believe, solar atmospheric changes are reflected in marked variations in terrestrial climate, we shall find these latter to be common to the whole earth, and to be represented by a function of the same form. The mere citation of local (for in this view even the climate of Europe is merely local) phenomena which have occurred at intervals approximately equal *individually* to the *average* length of a sun-spot period, proves nothing in favour of the view supported by your correspondent "H. W. C.," in NATURE, vol. xxiii. pp. 329, 363; and an analysis of the dates given in his first communication, which would make the occurrence of great frosts simultaneous, sometimes with sun-spot maxima, at other times with sun-spot minima, seems calculated to weaken his case in a material degree, on the supposition of an *uniform* eleven-year cycle.

Arranging the dates given by him in parallel column with the eleventh years of the present century, we get

Dates of severe frost.	1800 +
1. 1801—2	0
2. 1810—11	11
3. 1813—14	—
4. 1819—20	22
5. 1837—38	33
6. 1840—41	44
7. 1856—57	55
8. 1860—61	66
9. 1870—71	77
10. 1880—81	88

2 and 7 are placed as above, as those positions seem to favour the cyclic theory more than their original ones did. A *complete* list of great frosts collated with *actual* sun-spot variations is however most desirable, and would be specially valuable if representative of terrestrial climate in the cosmical sense. I trust that H. W. C. will favour us with such a table.

London, February 19 M. R. I. A.

Migration of the Wagtail

I FEAR I may be attempting to trespass too frequently on the columns of NATURE recently, but the paper in vol. xxiii. p. 387 on the subject of wagtails taking a passage on the backs of cranes in a long flight, resembles so much a somewhat similar story told and believed in by the Indians in several parts of North America, that I venture to send you an account of it.

All the Indians (Maskegon Crees) round the south-western part of Hudson's Bay, assert that a small bird of the Fringillidæ tribe takes a passage northward in the spring on the back of the Canada goose (*A. Canadensis*), which reaches the shores of Hudson's Bay about the last week of April.

They say that they have often seen little birds fly away from geese when the latter have been shot or shot at.

An intelligent, truthful, and educated Indian named George Rivers, who was very frequently my shooting companion for some years, assured me that he had witnessed this, and I believe I once saw it occur.

It is only the Canada goose that these little migrants use as an aërial conveyance, and certainly they both arrive at the same date, which is a week or two earlier than the other kinds of geese (*A. hyperboreus* and *albifrons*) make their appearance.

I knew the little bird well and have preserved specimens of it, but it is so long ago that I have forgotten the name.

The Indians on the shores of Athabasca and Great Slave Lakes—both great resorts of wild geese—tell a similar story. If a fabrication, I do not see why it should be invented about the Canada goose only, and not about other species which are equally numerous.

It may perhaps be necessary to explain that all the Coast Indians of Hudson's Bay devote a month or more every spring to wild fowl (chiefly geese) shooting, the game killed forming their entire food for the time.

As soon as the geese begin to arrive, the Indian constructs a concealment of willows and grass, usually near a pool of open water, at the edge of which he sets up decoys. When geese are seen approaching (usually flying at a great height) the Indian imitates their call, and the geese on seeing the decoys circle round, gradually coming lower down until within shot, when they are fired at. It is from these high-flying geese that the small birds are seen to come.

If the geese are flying low it is a pretty sure indication that they have already rested on the ground somewhere near, after their long flight, when of course their tiny passengers would have alighted. JOHN RAE

Royal Institution, February 26

Phosphorescence of the Sea

YOU will perhaps permit me to record the occurrence of a phenomenon very rarely witnessed on this coast—I mean the general and quasi-spontaneous luminosity of the sea.

It is of course common enough to observe sparkles of light more or less abundant when sea-water is briskly disturbed by contact with an oar or the bow of an advancing vessel; but it has only once before been my fortune, and that was twenty years ago, to witness the crest of each wavelet illuminated by the pale silvery light proceeding from countless phosphorescent organisms present in the water.

The night, being cloudy, favoured observation, but there was considerable haze. The wind was south-east or thereabouts, the temperature of the air being 52° F., that of the sea close by the shore 47°·5 F.

The phenomenon was visible on the night of Thursday, February 17 only. The following night was equally favourable for observation, and the temperatures were the same within a degree, but the cause or causes no longer operated. On casting into the sea a shower of pebbles, which the night before produced brilliant flashes of light, or larger stones, which then developed concentric luminous wavelets, only a doubtful effect was observed. The organisms had, it seemed, already expended their force—probably had actually died—and I thought I perceived an unusual frothiness in the water.

Is it not uncommon for this to occur so early in the year? It is in summer, when the temperature of the sea is high, that we expect to see the water "fiery." Was the phenomenon observed on other parts of the coast? THOS. B. GROVES

Weymouth, February 21

Minerva Ornaments

I HAVE twice had an opportunity of being in London during the time Dr. Schliemann's Trojan antiquities were exhibited at South Kensington, and the examination of them gave me very much pleasure. My last visit took place at the time Mr. Claypole's first letter and Prof. Sayce's reply appeared in NATURE, and I gave the "Minerva ornaments" particular attention. My interest in the subject has been revived by seeing another letter from Mr. Claypole in a recent number, and having refreshed my memory from notes taken during my visits, perhaps you would kindly afford me space for a few remarks.

Some of the "Minerva ornaments" appeared to me somewhat similar to Irish objects in my possession, but mine are more symmetrical, less flattish, and on the whole more suitable, I should say, for net-sinkers than the others, yet I never thought of ticketing them as such. I think that both sets of objects have had too much labour expended on them to favour the idea that they were used for such a common object as net-sinking. The Irish objects, which I should say are of stone, are identical in form with a class of glass ornaments known as double glass beads, found in most collections of Irish antiquities, which are certainly not net-sinkers. "Net-sinker" is a very common name in Ireland for almost any stone with a hole in it, and, without intending the slightest disrespect to Mr. Claypole, I believe the term is one of a set, of which "sling-stone" is another, applied in doubtful cases to cover our ignorance. As regards the use of the objects discovered by Dr. Schliemann, there may

© 1881 Nature Publishing Group

be good grounds for believing that they were idols; but had I been left without help to interpret for myself I should not have guessed them to be net-sinkers, but rather children's playthings—the ancient representatives of modern dolls. To show how little pains are sometimes taken in the preparation of net-sinkers, I may mention that a few months ago, while walking along the banks of the River Bann, I saw a fisherman cutting the tough sward into pieces about two inches by three or four, which, in answer to my inquiry, he informed me were intended for net-sinkers. I asked him why he did not use stone or lead, and he replied that turf sinkers were much superior, as in using them the nets never became entangled in the bottom of the river. I wonder if this custom is a recent invention or a survival from earlier times.

I was struck by the close resemblance which several other objects in the Schliemann collection bore to Irish antiquities. I have noted several tool-stones with the usual hollowed marks on the sides, especially those bearing the double numbers 26 and 1578, 26 and 1478, 26 and 1522, 45 and 1499, and also a stone celt or hatchet with marks on the sides like those on the tool-stones, and hammered at the edge, numbered 13 and 1505, all of which I could match from my own collection. Several whorls are marked in my notes as being similar to others found in Ireland, and an object bearing the numbers 6 and 1636 as being almost identical with double stone beads in my collection. I have also a large series of rubbing or polishing stones similar to others in Dr. Schliemann's collection. Hammer-stones numbered 6 and 7268, 26 and 1529, 26 and 1566, 13 and 1570 are perfect duplicates of some of those found by myself, with flint and bone implements, &c., at Portstewart and Ballintoy. The ornamentation on a few of the stone and glass whorls and beads in my collection have a sort of resemblance to that on some of the terra-cotta whorls exhibited by Dr. Schliemann.

Cullybackey, Belfast, February 10 W. J. KNOWLES

Selenium

THE use of selenium for the automatic registry of star transits, proposed by me in a letter which you were good enough to publish in NATURE, vol. xxiii. p. 218, leads to the idea of applying it in a somewhat similar way for photometric purposes, in order to improve the existing scale of star magnitudes, and to watch any variations therein. W. M. C.

Bombay, February 5

A CHAPTER IN THE HISTORY OF THE CONIFERÆ

THE Sequoias form the third genus of the Taxodieæ in the "Genera Plantarum." The only existing species are the Wellingtonia and the Red-wood of California, both of which are confined to the south-west coast regions of the United States. Their nearest living allies are Taxodium and Glyptostrobus; but these were as completely differentiated in the Eocene as at present, and they all appear, like the Ginkgo, to be survivals from more ancient floras; Sequoia especially had formerly a far wider range than it has at the present day.

The Sequoias are monœcious, and have obtusely ovate ligneous solitary and terminal cones one to two inches in length, which are persistent and gaping after shedding the seed. The scales are spirally disposed, sixteen to twenty in number, wedge-shaped, with an orbicular or transversely oblong nail-like head, depressed, wrinkled, and mucronate in the centre, sharing thus to some extent the ornamentation which seems a characteristic of the Taxodieæ. The foliage is distichous and yew-like in *Sequoia sempervirens*, and spiral and imbricated in *S. gigantea*, but both occasionally foliate in the opposite way. The former, or red-wood, occupies the Coast Range, a sandy rock rising to 2000 feet, of supposed Cretaceous age, and forms dense forests twenty to thirty miles in width, from a little south of Santa Cruz to the southern borders of Oregon, following the coast line for some 350 to 500 miles, its distribution depending, according to Prof. Bolander, upon the sandstone and oceanic fogs. The *S. gigantea* extends at intervals along the western slope of the Sierra Nevada for nearly 200 miles, and at elevations of 5000 to 8000 feet. "Towards the north the trees occur as very small, isolated, remote groves of a few hundreds each, most of them old and interspersed amongst gigantic pines, spruces, and firs, which appear as if encroaching upon them; such are the groves visited by tourists (Calaveras, Mariposa, &c.). To the south, on the contrary, the Big-trees form a colossal forest forty miles long and three to ten broad, whose continuity is broken only by the deep sheer-walled cañons that intersect the mountains; here they displace all other trees, and are described as rearing to the sky their massive crowns; whilst seen from a distance the forest presents the appearance of green waves of vegetation, gracefully following the complicated topography of the ridges and river-basins which it clothes."[1] The leaves are scale-formed, rounded dorsally, concave on the inner face and closely inlaid, regularly imbricated on the branchlets, longer and looser on the branches. In young trees they are much larger and freer, with long and awl-shaped leaves at an acute angle to the stem. No trees under cultivation in this country seem yet to have completely assumed the small imbricated foliage characteristic of the giant trees of California.

Although the types of foliage in the two existing species appear to be perfectly distinct, they are not really entirely so; for *S. sempervirens* preserves the spiral scale-like leaves for a short distance at the base of each branchlet, and *S. gigantea* sometimes assumes the distichous arrangement. Besides, the foliage of the former is not in two rows as it is in Taxodium, being spirally arranged round the stem; but the leaflets, where they are flat and comparatively expanded, have a strong tendency to crowd into two marginal rows, so that every surface becomes exposed to light and moisture. The leaflets take a half twist near their base, and then diverge upward or downwards towards the sides of the branchlet, an additional row frequently lying centrally along the branch.

The earliest-known Sequoias are Cretaceous, and were described by Carruthers, one as *S. Woodwardii* from Blackdown, and others as *S. Gardneri* and *S. ovalis* from the Folkestone Gault. The foliage from the latter has falcate leaves like Araucaria, and it is only inferred that it and the cones belonged to the same trees. It is not impossible that the cones may have been brought down from some high ground, and the foliage been shed by trees nearer the sea-level. Although Sequoia itself cannot be traced farther back than the Cretaceous, Schimper speculates on its probable derivation from some much older Araucarian form, and believes its position to be between the Cupressineæ and the Abietineæ.

Saporta regards the Chalk period as the age of Sequoias, and our principal knowledge of them is derived from Heer's "Flora fossilis arctica," where a large number are figured. Saporta speaks of Pattorfik as a Sequoia wood carpeted with ferns, and Ekkorfat as a forest composed of cycads, sequoias, and firs. *S. Reichenbachii* is the chief form, and occurs in the Cretaceous of Kome, Spitzbergen, and doubtfully at Atane. The foliage resembles the larger foliage of *S. gigantea*, being spiral, awl-shaped, set at an acute angle to the stem, and with the points overlapping. It differs in being less regularly spiral, and often combines an approach to the more distichous *S. sempervirens* type, being called in such cases, *S. Smittiana*. In several of the figured specimens from the Komeschichten the branchlets of the two forms are almost united, and a very slight degree more care in collecting would, it seems, have placed the reality of the union beyond the possibility of doubt. One instance is reproduced from plate xx., and a fragment from the same plate determined as *S. Reichenbachii*, to show that even apart from the frequent association of the two species on the same slabs, their distinctness cannot be maintained if the

---

[1] Lecture before Royal Institution, April 12, 1878, by Sir J. Hooker.

© 1881 Nature Publishing Group